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EXAMINER

WHITMORE, STACY

ART UNIT PAPER NUMBER

2812

DATE MAILED: 03/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/922,411

Applicant(s)

KHAZEI, MEHYAR

Examiner

Stacy A Whitmore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-27, 29-47 and 49-53 is/are rejected.
- 7) ☒ Claim(s) 12, 28 and 48 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the susceptibility profile must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

2. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 5, 10-11, 13-15, 19, 21, 26-27, 29, 34-35, 39, 41, 46, and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Kashyap, N., "An expert system for predicting radiated EMI from PCB's".

4. As for claim 1, Kashyap disclosed the invention as claimed, including an apparatus for electromagnetic compatibility-driven design, said apparatus comprising:
an electromagnetic field calculator configured and arranged to receive (A) placement information relating to a relative placement of a plurality of circuit components and (B) at least one emissions profile, each emissions profile corresponding to one among the plurality of circuit components [pg. 446, The input

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stage first paragraph; pg. 446, right hand side, second and fifth full paragraphs; pg. 447, fig. 1; pg. 448, evaluation stage calculation of e-fields]; and

an electromagnetic interference calculator coupled to the electromagnetic field calculator and configured and arranged to receive at least one susceptibility profile, each susceptibility profile corresponding to one among the plurality of circuit components [pg. 446, The input stage first paragraph; pg. 446, right hand side, second and sixth full paragraphs; pg. 448, evaluation stage, and especially right hand side, second full paragraph],

wherein the electromagnetic field calculator is further configured and arranged to output information regarding an induced electromagnetic field [pg.448-449, estimation and output stages], and

wherein the electromagnetic interference calculator is further configured and arranged to receive the information regarding an induced electromagnetic field and to output information regarding effects caused by the induced electromagnetic field [pg.448-449, estimation and output stages].

5. As for claim 2, Kashyap further disclosed wherein the electromagnetic field calculator is further configured and arranged to receive a circuit description, the circuit description including (E) at least one circuit component characterization, each circuit component characterization corresponding to one among the plurality of circuit components, and (F) connectivity information, said connectivity information relating to at least one electrical pathway, each electrical pathway connecting at least two among the plurality of circuit components [abstract, pg. 446, The input stage paragraphs 1, 8, and 10-12; pg. 448, the evaluation stage].

6. As for claim 3, Kashyap disclosed, wherein the circuit description includes a schematic representation [pg. 445, Justification section, paragraph two symbols, nets; and pg. 449, Conclusion section, second paragraph].

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7. As for claim 5, Kashyap, disclosed wherein the circuit description includes a netlist [pg. 445, Justification section, paragraph two symbols, nets; and pg. 449, Conclusion section, second paragraph].

8. As for claim 10, Kashyap, disclosed wherein the placement information includes information relating to relative spatial locations and orientations among said plurality of circuit components [pg. 445, Justification section, second paragraph; pg. 446, The input stage, first paragraph].

9. As for claim 11, Kashyap disclosed wherein the placement information includes information relating to relative spatial dimensions of said plurality of circuit components [pg. 445, Justification section, second paragraph; pg. 446, The input stage, first paragraph].

10. As for claim 13, Kashyap disclosed wherein each susceptibility profile represents a response of the corresponding circuit component to an electromagnetic field produced by a source of predetermined character and location [pg. 446, right hand side, sixth full paragraph; pg. 448, right hand side, first full paragraph].

11. As for claims 14 and 34, Kashyap disclosed, a method for electromagnetic compatibility-driven design, said method comprising:

And

A data storage medium having machine-readable code, the machine-readable code including instructions executable by an array of logic elements, said instructions defining a method for electromagnetic compatibility-driven design comprising

calculating an induced electromagnetic field based on (A) placement information relating to a relative placement of a plurality of circuit components and (B) ,at least one emissions profile, each emissions profile corresponding to one among the plurality of circuit components, and calculating effects of the induced electromagnetic field based on at least one susceptibility profile, each susceptibility profile corresponding to one among the plurality of circuit components [pg. 446, The input stage first paragraph; pg.

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446, right hand side, second and fifth and sixth full paragraphs; pg. 447, fig. 1; pg. 448, evaluation stage calculation of e-fields, also pg. 448, evaluation stage, and especially right hand side, second full paragraph; pg. 448-449, estimation and output stages].

12. As for claims 15 and 35, Kashyap further disclosed wherein calculating an induced electromagnetic field is based on a circuit description including (E) at least one circuit component characterization, each circuit component characterization corresponding to one among the plurality of circuit components, and (F) connectivity information, said connectivity information relating to at least one electrical pathway, each electrical pathway connecting at least two among the plurality of circuit components [abstract, pg. 446, The input stage paragraphs 1, 8, and 10-12; pg. 448, the evaluation stage].

13. As for claims 19 and 39, Kashyap further disclosed wherein the circuit description includes a schematic representation [pg. 445, Justification section, paragraph two symbols, nets; and pg. 449, Conclusion section, second paragraph].

14. As for claims 21 and 41, Kashyap further disclosed wherein the circuit description includes a netlist [pg. 445, Justification section, paragraph two symbols, nets; and pg. 449, Conclusion section, second paragraph].

As for claims 26 and 46, Kashyap further disclosed wherein the placement information includes information relating to relative spatial locations and orientations among said plurality of circuit components [pg. 445, Justification section, second paragraph; pg. 446, The input stage, first paragraph].

15. As for claims 27 and 47, Kashyap further disclosed wherein the placement information includes information relating to relative spatial dimensions of the plurality of circuit components [pg. 445, Justification section, second paragraph; pg. 446, The input stage, first paragraph].

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16. As for claims 29 and 49, Kashyap further disclosed wherein each susceptibility profile represents a response of the corresponding circuit component to an electromagnetic field produced by a source of predetermined character and location [pg. 446, right hand side, sixth full paragraph; pg. 448, right hand side, first full paragraph].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 4, 20, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashyap, N., "An expert system for predicting radiated EMI form PCB's"

18. As for claims 4, 20, and 40, as applied to claims 1-2, 14-15, and 34-35, Kashyap disclosed the invention substantially as claimed, including he apparatus for electromagnetic compatibility-driven design including a the circuit description including a plurality of expressions [pg. 445, Justification section, paragraph two symbols, nets; and pg. 449, Conclusion section, second paragraph].

Kashyap did not specifically disclose a hardware description language.

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"Official Notice" is taken that both the concepts and advantages for using a hardware description language are well known and expected in the art for the purpose of representing circuit descriptions. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a hardware description language for representing Kashyap's circuit components in a hardware description language in order to provide for a way of modeling the circuit for functionality.

19. Claims 30 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashyap, N., "An expert system for predicting radiated EMI from PCB's" in view of Natesan, V. et al., "Performance driven placement for cell-based designs".

20. As for claims 30 and 50, Kashyap disclosed the invention substantially as claimed, including a method for electromagnetic compatibility-driven design and a data storage medium having machine-readable code, the machine-readable code including instructions executable by an array of logic elements, said instructions defining a method for electromagnetic compatibility-driven design, said method comprising:

receiving a circuit description including (A) at least one circuit component characterization, each circuit component characterization corresponding to at least one among a plurality of circuit components, and (B) connectivity information relating to at least one electrical pathway, each electrical pathway connecting at least two among the plurality of circuit components [abstract, pg. 446, The input stage paragraphs 1, 8, and 10-12; pg. 448, the evaluation stage];

based on the placement information and at least one emissions profile, calculating an induced electromagnetic field [pg. 446, The input stage first paragraph; pg. 446, right hand side, second and fifth full paragraphs; pg. 447, fig. 1; pg. 448, evaluation stage calculation of e-fields]; and

based on at least one susceptibility profile, calculating effects of the induced electromagnetic field, wherein each emissions profile corresponds to one among the plurality of circuit components [pg. 446, The input stage first paragraph; pg. 446, right

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hand side, second and sixth full paragraphs; pg. 448, evaluation stage, and especially right hand side, second full paragraph], and

wherein each susceptibility profile corresponds to one among the plurality of circuit components [pg. 446, The input stage first paragraph; pg. 446, right hand side, second and sixth full paragraphs; pg. 448, evaluation stage, and especially right hand side, second full paragraph].

Kashyap did not specifically disclose that based on the circuit description, calculating placement information relating to a relative placement of the plurality of circuit components.

Natesan disclosed based on a circuit description, calculating placement information relating to a relative placement of the plurality of circuit components [pg. 237-239, abstract, and section 2].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Kashyap and Natesan because Natesan's calculating relative placement of circuit components based on a circuit description allows for performance driven placement which would benefit Kashyap's system by allowing Kashyap's system to manipulate circuit placement with criterion related to spacing of circuit components which aid in optimizing circuit layout for decreasing EMI problems.

21. Claims 16-18, 31-33, 36-38, and 51-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashyap, N., "An expert system for predicting radiated EMI from PCB's" in view of Natesan, V. et al., "Performance driven placement for cell-based designs", and further in view of Childs, B., "Fast interactive EMC analysis for design engineers".

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22. As for claims 16-18, 31-33, 36-38, and 51-53 Kashyap in view of Natesan disclosed the invention substantially as claimed, including the including a method for electromagnetic compatibility-driven design and a data storage medium having machine-readable code, the machine-readable code including instructions executable by an array of logic elements, said instructions defining a method for electromagnetic compatibility-driven design as cited in the rejections of claims 14-15, 30, 34-35 and 50 above, including placement information, the circuit description, and the calculated effects of the induced electromagnetic field, and further including the comparison of EMC design rules to the circuit and suggesting design changes [pg.447, fig. 1].

Kashyap in view of Natesan did not disclose calculating a simulated circuit operation, comparing the simulation to at least one criterion, and modifying the circuit based on the result of comparison.

Childs disclosed calculating a simulated circuit operation, comparing the simulation to at least one criterion, and modifying the circuit based on the result of comparison [pg. 3, fig. 2; -pg. 5].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Kashyap in view of Natesan, and Childs because the simulation of circuits for the purpose of determining circuit operating characteristics is well known in the art. The use of simulation for the purpose of the simulation to at least one criterion, and modifying the circuit based on the result of comparison would have provided Kashyap in view of Natesan's system with a well known method of determining EMI problem areas of the circuit and also provide a method of making changes where necessary in order to decrease EMI problems.

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23. Claims 6-9, 22-25, and 42-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashyap, N., "An expert system for predicting radiated EMI from PCB's" in view of Marano, G. et al., "Field tests on telecommunications systems: an evaluation of the radiated emissions by near field probe.

24. As for claims 6-9, 22-25 and 42-45, Kashyap disclosed the invention substantially as claimed, including method for electromagnetic compatibility-driven design, said method comprising:

And

A data storage medium having machine-readable code, the machine-readable code including instructions executable by an array of logic elements, said instructions defining a method for electromagnetic compatibility-driven design, and calculating the electromagnetic field, emissions profile as cited in the rejections of claims 1 and 34 above.

Kashyap did not disclose calculating the induced electromagnetic field based on one of a characteristic and location of an electromagnetic shielding element; emissions profile includes results of a plurality of electromagnetic near-field measurements; wherein for at least one emissions profile, each among said plurality of electromagnetic near-field measurements is associated with a location in a grid, said grid having at least two spatial dimensions and amplitude and a direction

Marano disclosed calculating the induced electromagnetic field based on one of a characteristic and location of an electromagnetic shielding element [pg. 918, introduction section; pg. 919, experimental results section]; emissions profile includes results of a plurality of electromagnetic near-field measurements [pg. 918, introduction section; pg. 919, experimental results section]; wherein for at least one emissions profile, each among said plurality of electromagnetic near-field measurements is associated with a location in a grid, said grid having at least two spatial dimensions and amplitude and a direction [pg. 918, Introduction section, especially fig. 1].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Kashyap and Marano because Marano's use of electronic shielding elements, near-field measurements, grid and spatial dimensions, amplitude and direction associated with electromagnetic fields would have allowed Kashyap's system to evaluate the effects of electromagnetic fields due to shielding and where the electromagnetic fields are directed in order to determine where changes are needed in circuit design.

Allowable Subject Matter

25. Claims 12, 28, and 48 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to disclose either singularly or in combination a system for electromagnetic compatibility-driven design wherein each among said at least one emissions profile includes results of a plurality of electromagnetic near-field measurements, and wherein for at least one emissions profile, each among said plurality of electromagnetic near-field measurements is associated with a location in a grid, said grid having boundaries and at least two spatial dimensions, and wherein the information regarding an induced electromagnetic field includes a plurality of amplitudes of the induced electromagnetic field, and wherein each among the plurality of amplitudes corresponds to one among a plurality of spatial locations, and wherein at least one among the plurality of spatial locations lies outside the boundaries of said grid.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stacy A Whitmore whose telephone number is (703)

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305-0565. The examiner can normally be reached on Monday-Thursday, alternate Friday 6:30am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (703) 308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Stacy A Whitmore

Patent Examiner

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A handwritten signature in black ink, appearing to read 'Stacy A. Whitmore', is written over the printed name and title.

SAW

March 12, 2003